

Abstract of the Disclosure

A method for adjusting the optical properties of an anti-reflective coating layer by thermal annealing is described. In the method, a dielectric ARC layer of SiON is first deposited by plasma enhanced CVD to a thickness of at least 500 Å. The dielectric ARC layer is deposited on a silicon nitride layer or on a polysilicon layer which can withstand the annealing temperature used for the dielectric ARC layer. The dielectric ARC layer can be annealed at a temperature of at least 400°C, or in a temperature range between about 400°C and about 1,000°C. The annealing process can be conducted in a gas environment that contains at least one of N₂ and O₂. A suitable annealing time is between about 1 min. and about 30 min., or preferably between about 3 min. and about 5 min. The annealing process has substantially no effect on the value of the reflective index, n , the present invention novel method allows adjustment in the extinction coefficient, k , to be made independently in the SiON dielectric ARC layer.